EPO No. 22

Examination Procedure Outline for

Retail Motor-Fuel Dispensers
Blended Product

It is recommended that this outline be followed for blending-type, power-operated retail dispensers--"gasoline pumps," analog or digital, and consoles. Nonretroactive requirements are followed by the applicable date in parentheses.

SAFETY NOTES

When excerpting this Examination Procedure Outline for duplication, the "Safety Considerations" section and the "Glossary of Safety Key Phrases" should be duplicated and included with the outline.

The inspector is reminded of the importance of evaluating potential safety hazards prior to an inspection and taking adequate precautions to avoid personal injury or damage to the device. The inspector should read and be familiar with the introductory section on safety found at the beginning of this publication. As a minimum, the following safety precautions should be noted and followed during the inspection. Definitions of each reminder are found in the "Glossary of Safety Key Phrases" at the back of this publication.

Many policies and regulations will vary from jurisdiction to jurisdiction. It is essential that the inspector or serviceperson be aware of all safety regulations and policies in place at the inspection site and to practice the safety policies established by the inspector's or serviceperson's employer. The safety reminders included in this EPO contain general guidelines for safety. These guidelines are useful in alerting inspectors and servicepersons to the importance of taking adequate precautions to avoid personal injuries. These guidelines can only be effective in mitigating safety hazards if inspectors and servicepersons receive training in hazard recognition and controls.

Clothing

Electrical Hazards

Emergency Procedures

Eye Protection

Fire Extinguisher

First Aid Kit

Grounding

Ignition Sources

Lifting

Location
also: **Wet/Slick Conditions, Chemicals, Hazardous Materials, Petroleum Products, Obstructions**

Material Safety Data Sheets (MSDS)

Nature of Product

Personal Protection Equipment
e.g. Safety Shoes, Safety Aprons, Gloves, Barrier Cream, etc. if deemed necessary

Safety Cones/Warning Signs

Static Discharge

Switch Loading

Traffic

Transportation of Equipment

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Inspection:

Safety First !!!

Check the inspection site carefully for safety hazards and take appropriate precautions

Learn the nature of hazardous products used at or near the inspection site – obtain and read Copies of MSDS's

Know emergency procedures and location and operation of fire extinguisher and emergency shut-offs

Post safety cones/warning signs and be aware of vehicular and pedestrian traffic patterns

Use caution in moving in wet, slippery areas

Use personal protection equipment and clothing appropriate for the inspection site

Open both sides of dispenser to allow fumes to dissipate before proceeding with the inspection of the dispenser

If leaks, spills, or exposed wiring cause hazardous testing conditions it is recommended that the testing be discontinued until the unsafe conditions are corrected

Be sure that a first aid kit is available and that it is appropriate for the type of inspection activity

H-44 General Code and Liquid-Measuring Devices Code References

1. General considerations.
   - Selection ..... G-S.3., G-UR.1.1., G-UR.1.2., G-UR.1.3.
   - Installation ..... G.S.2, G-UR.2.1., G-UR.2.2. UR.2.1., UR.2.4.
   - Position of Equipment ..... G-UR.3.3.
   - Accessibility ..... G-UR.2.3.
   - Assistance ..... G-UR.4.4.
   - Use and maintenance ..... G-UR.3.1., G-UR.4.1., G-UR.4.2., UR.3.5.

2. Marking G-S.1., G-UR.2.1.1., G-UR.3.4., S.4.1., S.4.4. (1/1/85)

3. Indicating and recording elements.
   - Design ..... S.1.1.
   - Units ..... S.1.2.1., S.1.2.3.(a)
   - Readability ..... G-S.5., G-S.6. (1/1/77), G-S.7., S.1.4., S.1.5.
   - Values of intervals ..... G-S.5.3., G-S.5.3.1.
   - Indication of delivery ..... S.1.6.1.
   - Money-value divisions
     - Analog ..... S.1.6.5.1.
     - Digital ..... S.1.6.5.2.
     - Auxiliary indications S.1.6.5.3. (1/1/85)
   - Unit Price and product identity ..... S.1.6.4.1.(a), S.1.6.4.2., U.R.3.2.
   - Multiple unit price dispensers ..... S.1.6.4.1.(b) (1/1/91), S.1.6.5.(a) (1/1/91), S.1.6.5.4. (1/1/91), UR.3.3.

3. Indicating and recording elements (cont.).
   - Advancement and return to zero ..... S.1.3., S.1.6.3., UR.3.1.
   - Recorded representations, point of sale systems S.1.6.7. (1/1/86)
   - Provision for sealing ..... G-S.8.(1/1/90), G-UR.4.5., S.2.2.(a&b), S.2.2.(c) (1/1/95)

4. Measuring elements.
   - Air eliminator vent, if self-contained dispenser ..... S.2.1.
   - Security seal on adjusting mechanism ..... G-UR.4.5.

5. Discharge hose-Retail ..... S.3.1., S.3.2., S.3.3., S.3.5., S.3.6., UR.1.1.
   - Marinas and Airports ..... UR.1.1.2.

6. Totalizers S.5. (1/1/95)

Pretest Determinations:

1. Tolerances.
   - Applicable requirements ..... G-T., T.1.
   - Basic Tolerance Values ..... T.2.1.

2. Product storage identification ..... UR.2.5.

Test Notes:

Wear appropriate personal protection equipment such as petroleum-resistant, nonskid safety shoes (to prevent possible injury from spills or slipping on slick surfaces), protective clothing, and eye protection to prevent injury from splashed product

Do not leave an activated dispenser unattended !

1. If test measure is dry, add 16.4 mL (one cubic inch) to gauge reading to allow for amount of liquid required to "wet" measure.

2. Hand held test measures require a 30-second (± 5 second) pour followed by a 10-second drain, with the measure held at a 10 to 15 degree angle from vertical. (see NIST HB 105-3, Specifications and Tolerances for Graduated Neck Type Volumetric Field Standards, 1997, section 7).

Ground test measure properly and only use a metal funnel when returning product to storage

Test Notes (cont.)

3. To determine proper operation of totalizers, read and record the totalizer indications before and after all test drafts. S.5. (1/1/95)

4. After each test draft:
   a. print ticket if device is so equipped ..... G-S.5.6., S.1.6.7. (1/1/86), UR.3.4.
   b. check price computations on all indicators (including consoles) and on recorded representations. ..... S.1.6.5.(a) (1/1/91)
      digital equipment ..... G-S.5.5.
      analog equipment ..... S.1.6.5.(b), N.4.3.2.
   c. check for agreement between indications ..... G-S.5.2.2., S.1.6.6.(a), S.1.6.6.(b) (1/1/88)
   d. check display of quantity and total price S.1.6.5.5. (1/1/94)

Test:

Use proper lifting techniques when lifting test measure !

Be aware of and attempt to eliminate potential ignition sources in or near the inspection site

Be aware of vehicular and pedestrian traffic when moving between dispenser and storage tanks

1. Test at lowest grade. Set selector control so that lowest grade product is dispensed.
   Normal test—full flow, basic tolerance ..... N.1.1., N.2., N.3.4., N.4.1., T.2.1.
   At the beginning of the first delivery, check for suppressed values. ..... S.1.6.1.
   If first test result is at or near the tolerance limit, repeat this test. ..... T.2.1.3.

   Petroleum Product Sampling[1] Lowest Octane.

[1] When taking gasoline samples from blended product dispensers, the samples should be collected after an observed sale of the particular grade or product to be tested, or sufficient product should be purged from the hose to ensure the sample is representative of the grade or product being sampled. The National Conference on Weights and Measures policy on procedures for taking samples for octane verification is as follows: **"A minimum of a liter (0.3 gallon) of engine fuel shall be flushed from the dispensers before taking a sample for octane verification. This flush shall be returned to the storage tank containing the lowest octane."** (see NCWM Publication 21, Petroleum Products Sampling Procedures and Safety Manual, August 1997).

Test (cont.):

2. Test at highest grade. Set selector control so that highest grade product is dispensed.
Normal test—full flow, basic tolerance .....N.3.4., N.4.1., T.2.1.

If this test is at or near tolerance limit, repeat this test .....T.2.1.3.

Petroleum Product Sampling[1] Highest Octane

3. Test at blend. Set selector control at intermediate blend. Special test--slow flow, basic tolerance.....N.4.2., N.4.2.2., T.2.1.

If this test result is at or near the tolerance limit and the error is the same as or greater then the average error of the previous tests, repeat this test.....T.2.1.3.
Otherwise,slow flow test at first blend above lowest grade and first blend beneath highest grade.

Petroleum Product Sampling[1] Blended Product

Return blended product to the storage tank containing the lowest octane

4. Check money-value computations on other blends. Set selector control at each of the remaining blends and dispense 1 indicated liter/gallon to check
Computed price. ....UR.3.2.
Digital equipment .....G-S.5.5.
Analog equipment .....S.1.6.5.(b), N.4.3.2.

5. RFI/EMI test (electronic equipment only).....G-N.2., G-UR.1.2., G-UR.3.2., G-UR.4.2.
radio frequency interference (RFI)
electromagnetic interference (EMI)

4. Check effectiveness of anti-drain means .....S.3.7.

[1] When taking gasoline samples from blended product dispensers, the samples should be collected after an observed sale of the particular grade or product to be tested, or sufficient product should be purged from the hose to ensure the sample is representative of the grade or product being sampled. The National Conference on Weights and Measures policy on procedures for taking samples for octane verification is as follows: **"A minimum of a liter (0.3 gallon) of engine fuel shall be flushed from the dispensers before taking a sample for octane verification. This flush shall be returned to the storage tank containing the lowest octane."** (see NCWM Publication 21, Petroleum Products Sampling Procedures and Safety Manual, August 1997).

Test (cont.):

5. Check effectiveness of zero-setback interlock. .....S.2.5.
   On equipment with remote pumping systems, activate one dispenser and check all others operated by the same pump to make certain they will not operate without activating the individual starting levers.

6. Power loss test .....S.1.6.2.1.(1/1/83), S.1.6.2.2. (1/1/83)
   Check with your supervisor before requiring shutdown of power to equipment under test.

7. Security seal.....G-UR.4.5.

Record on the official report the number of gallons of product dispensed during test.

Avoid switch loading!
Test devices dispensing low-vapor pressure products (e.g., diesel fuel, kerosene)
Before testing devices dispensing high-vapor pressure products (e.g., gasoline)

After all equipment at a location has been tested, review results to determine compliance with equipment maintenance and use of adjustments.....G-UR.4.1., G-UR.4.3.

Take precautions to isolate equipment when
Transporting it to avoid exposure to hazardous fumes